

**2004 GALVESTON BAY INVASIVE SPECIES RISK ASSESSMENT
INVASIVE SPECIES SUMMARY**

Created by: Environmental Institute of Houston, University of Houston-Clear Lake
and the Houston Advanced Research Center

Common Name: Chinese mitten crab
Latin Name: <i>Eriocheir sinensis</i>
Category: Aquatic Animal
Place of Origin: “Indigenous to the low-lying areas of northern China and as far as Shanghai (Nepzy and Leach, 1973) (http://www.gsmfc.org/nis/nis/Eriocheir_sinensis.html).”
<p>Place of Introduction: “In North America, specimens were captured by gillnets in Lake Erie in 1973 and from a water-intake pipe at Belle Isle in the Detroit River at Windsor, Ontario in 1965 (Nepzy and Leach, 1973).</p> <p>Collected near mouth of Mississippi River, new St. Bernard Parish Hwy. to Hwy. 46 intersection, Bay Garden, near La. wildlife and fish camp, Louisiana. Collected by George Jackson, 19 March, 1987 (D. L. Felder per. com., 1997; F.C.S.C., 1998). Maps: Museum Records: Specimen deposited in the University of Southwestern Louisiana Museum Zoological Collection, USLZ 3684 (http://www.gsmfc.org/nis/nis/Eriocheir_sinensis.html).”</p>
Date of Introduction: First found 1973 in Lake Erie, 1987 near the mouth of the Mississippi River.
<p>Life History: “Chinese mitten crabs spend the greatest proportion of their life in fresh water, and this seems to be of adaptive significance. Osmotic autoregulation is what allows these animals to compensate for moderate, irregular perturbations of NaCl homeostasis induced by food uptake, land visits, or during molting phases. Moreover, this may be an important mechanism in NaCl absorption when the adults return to the sea for reproduction (Onken, 1996). As sexually maturity approaches in their fourth or fifth year (CL 38-50 mm), the Chinese mitten crab begin migrating towards the sea. The movement starts during the summer and usually the crabs reach puberty during the final stages of the journey, in brackish water of tidal estuaries. Males are the first to arrive and mating starts as soon as the females reach the estuaries. Mated females continue seaward as the eggs are spawned about 24 hours after mating and the substance that fixes the eggs to the abdominal limbs appear to harden at salinities above 26 ppt. Throughout the winter, the ovigerous females remain in deep waters while the eggs slowly develop. The success of this single reproductive event is optimized by the production of 250,000 to over 1 million eggs according to female body size (Ingle, 1986). (http://www.gsmfc.org/nis/nis/Eriocheir_sinensis.html).”</p>
Growth/Size: “Males and females grow to a maximum carapace width of approximately 80 mm (3 inches) in the estuary (http://www.delta.dfg.ca.gov/mittencrab/).”
Feeding Habits/Diet: “Mitten crabs are omnivores, with juveniles eating mostly vegetation, but preying upon animals, especially small invertebrates, as they grow. In the Delta, adult crabs have been incidentally caught by anglers using a variety of baits, ranging from ghost shrimp to shad (http://www.delta.dfg.ca.gov/mittencrab/).”
Habitat: “The normal habitat of the adults is the bottoms and banks of freshwater rivers and estuaries; individuals prefer hard bottom and areas covered with submerged plants, which are the main food source (Nepzy and Leach, 1973) (http://www.gsmfc.org/nis/nis/Eriocheir_sinensis.html).”
Attitude (aggressive, etc.): “Biological: In the Far East, mitten crabs are one of the intermediate hosts of lung flukes, one species of which, <i>Paragonimus ringeri</i> (Cobbold), occurs in humans (Ingle, 1986). Economical: It is commercially important in western Korea (Kim and Hwang, 1995). Mitten crabs are proficient burrowers. In soft river banks, they form horizontal and vertical tunnels at densities up to 30/m ² , 20-80 cm in depth and 2-12 cm in diameter. Extensive burrowing can cause rupturing of dike walls and eventual collapse of river banks (Ingle, 1986) (http://www.gsmfc.org/nis/nis/Eriocheir_sinensis.html).”
<p>Physical Description: “The Chinese mitten crab can be recognized by its carapace. The carapace is markedly convex and very uneven, with four sharply edged epigastric lobes. Front composed of four acuminate teeth, which are deeply separated; the fourth antero-lateral tooth distinct. Propodus of the last ambulatory legs rather narrower and slender, their dactylus sharply claw-shaped. External maxillipeds are not very slender, the median hiatus between them being considerably narrower. Chela has the hairs always on outer surface or both on outer and inner surfaces (fur usually forms a conspicuous furry "mitten" on each claw, from which the crab derives its common name). Propodus of anterior two pairs of ambulatory legs with no longitudinal row of hairs on dorsal surface (Sakai, 1939). Mature male: Mature female: Larval stages: This species passes through five zoeal stages before metamorphosis to the megalopal stage. In the laboratory and at 25°C, the megalopa and the first crab instar can be attained in minimum 15 and 25 days after</p>

hatching, respectively. In all zoeal stages of *E. japonicus* the lengths of the second antenna, all carapace spines, carapace width, and distance between the tips of lateral carapace spines are the longest. However, the carapace of *E. sinensis* is slightly longer than that of *E. japonicus* in the fourth and fifth zoeal stages (Kim and Hwang, 1995) (http://www.gsmfc.org/nis/nis/Eriocheir_sinensis.html).”

Management Recommendations / Control Strategies: include references for existing site-specific strategies

Chinese mitten crab Control Committee. 2002. A Draft National Management Plan For the Genus *Eriocheir*. Submitted to the Aquatic Nuisance Species Task Force. February. <http://www.anstaskforce.gov/Chinese-mitten-crab-plan2-02.htm>.

References (includes journals, agency/university reports, and internet links):

1. http://www.gsmfc.org/nis/nis/Eriocheir_sinensis.html. Gulf of Mexico Program.
2. <http://www.delta.dfg.ca.gov/mittencrab/>. California Department of Fish and Game. Bay-Delta.
3. <http://www.anstaskforce.gov/Chinese-mitten-crab-plan2-02.htm>. Chinese mitten crab Control Committee. 2002. A Draft National Management Plan For the Genus *Eriocheir*. Submitted to the Aquatic Nuisance Species Task Force. February.
4. Nepszy, S. J. and J. H. Leach. 1973. First records of the Chinese mitten crab, *Eriocheir sinensis*, (Crustacea: Brachyura) from North America. *Journal of Fisheries Research Board of Canada* 30(2): 1909-1910.
5. Onken, H. 1996. Active and electrogenic absorption of Na⁺ and Cl⁻ across posterior gills of *Eriocheir sinensis*: influence of short-term osmotic variations. *The Journal of Experimental Biology* 199: 901-910.
6. Ingle, R. W. 1986. The Chinese mitten crab *Eriocheir sinensis* H. Milne Edwards – a contentious immigrant. *The London Naturalist* 65:101-105.
7. Sakai, T. 1939. Studies on the Crabs of Japan. IV. Brachygnatha, Brachyrhyncha. Tokyo. 741 pp. + plates.
8. Kim, C. H. and S. G. Hwang. 1995. The complete larval development of the mitten crab, *Eriocheir sinensis* H. Milne Edwards, 1853 (Decapoda, Brachyura, Grapsidae) reared in the laboratory and a key to the known zoeae of the Varuninae. *Crustaceana* 68(7):793-812.

Available Mapping Information:

Amy J. Benson and Pam L. Fuller. 1999. Nonindigenous Crustaceans in the United States. U.S. Geological Survey, Biological Resources Division. Presented at the Zebra Mussel and Other Aquatic Nuisance Species Conference Duluth, MN. April. http://www.fcsc.usgs.gov/posters/Nonindigenous/Nonindigenous_Crustaceans/nonindigenous_crustaceans.html. Map of introduction places.